



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

11.9

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,806	12/09/2003	Xiong Liu	S104.12-0047/STL 11383	5735
27365 7590 07/05/2007 SEAGATE TECHNOLOGY LLC C/O WESTMAN CHAMPLIN & KELLY, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402-3319			EXAMINER SUN, XIUQIN	
			ART UNIT 2863	PAPER NUMBER
			MAIL DATE 07/05/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/731,806	Applicant(s) LIU ET AL.	
	Examiner Xiuqin Sun	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-14 and 18-20 is/are rejected.
- 7) ☒ Claim(s) 5, 6 and 15-17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/09/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Election/Restrictions

1. Applicant's election without traverse of Species I (amended claims 1-20) is acknowledged.

Claim Objection

2. Claims 2-6 is objected to because of the following informalities:
 - 1) The abbreviation "VCM" needs to be spelled out then followed by "(VCM)".
 - 2) Claim 13 is objected to since it improperly depends on itself. Examiner assumed claim 13 is depends on claim 12 for examination this time.
 - 3) Claims 14-17 are objected to since they depend on objected claims.Appropriate correction is required.

Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 7-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 7-11, the recitation of the phrase "a longitudinal axis of the track accessing arm" renders the claims indefinite, because there is insufficient antecedent basis or definition for "the track accessing arm" in the claims.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-4, 12-14 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Thia et al. (U. S. Pat. No. 20010038508).

Regarding claim 1, Thia et al. disclose a method of determining mass unbalance of an actuator mechanism in a system (sections 0006 and 0007), the method comprising: calculating a center of gravity in first x and y components with respect to a first coordinate system (Fig. 2) of the actuator mechanism (sections 0025-0030); calculating the center of gravity in second x and y components with respect to a second coordinate system (Fig. 3) of the actuator mechanism (sections 0025-0030); and calculating a total mass unbalance of the actuator mechanism as function of the first x and y components and the second x and y components (sections 0019-0023).

Regarding claim 2, Thia et al. disclose: wherein calculating the center of gravity of the actuator mechanism with respect to the first coordinate system comprises: calculating the first y component in the first coordinate system (sections 0025-0030),

wherein the first y component is in a first y-axis that intersects the pivot shaft of the actuator mechanism and is parallel to a longitudinal axis of the system (Fig. 6); and calculating the first x component in the first coordinate system (sections 0025-0030), wherein the first x component is in a first x-axis that intersects the pivot shaft of the actuator mechanism and is normal to the first y-axis (Fig. 6).

Regarding claim 3, Thia et al. disclose: wherein calculating the first y component in the first coordinate system comprises: obtaining a first voice coil motor (VCM) current (section 0018) when the system is oriented in a first orientation (Fig. 2); and obtaining a second VCM current (section 0018) when the system is oriented in a second orientation (Fig. 3).

Regarding claim 4, Thia et al. disclose: wherein the first y component is calculated as a function of the first VCM current, the second VCM current, a torque constant of the VCM and a mass of the actuator mechanism (sections 0018-0023).

Regarding claim 12, Thia et al. disclose a method of determining mass unbalance of an actuator mechanism (section 0006), the method comprising: obtaining a current drawn by the actuator mechanism from a voice coil motor (VCM) (sections 0007, 0016 and 0018); and calculating the mass unbalance of the actuator mechanism as a function of the current drawn by the actuator mechanism (sections 0007 and 0019).

Regarding claim 13, Thia et al. disclose: wherein calculating the mass unbalance comprising: calculating a center of gravity in first x and y components with respect to a first coordinate system (Fig. 2) of an actuator mechanism (sections 0025-0030); calculating the center of gravity in second x and y components with respect to a second

coordinate system (Fig. 3) of the actuator mechanism (sections 0025-0030); and calculating a total mass unbalance of the actuator mechanism as a function of the calculated first and second centers of gravity (sections 0019-0023).

Regarding claim 14, Thia et al. disclose: obtaining a first VCM current (section 0018) when the actuator mechanism is oriented in a first orientation (Fig. 2); obtaining a second VCM current (section 0018) when the actuator mechanism is oriented in a second orientation (Fig. 3); and calculating the first y component in a first y-axis as a function of the first VCM current and the second VCM current (sections 0018-0023).

Regarding claim 18, Thia et al. disclose an apparatus comprising: a voice coil motor configured to rotate the actuator mechanism about a pivot shaft (Fig. 1; section 0016), the actuator mechanism drawing a current from the voice coil motor (sections 0016 and 0018); and means for determining the mass unbalance of the actuator mechanism as a function of x and y components in first and second coordinate systems (sections 0018 and 0036).

Regarding claim 19, Thia et al. disclose: calculating a center of gravity in first x and y components with respect to a first coordinate system (Fig. 2) of an actuator mechanism (sections 0025-0030); calculating the center of gravity in second x and y components with respect to a second coordinate system (Fig. 3) of the actuator mechanism (sections 0025-0030); and calculating a total mass unbalance of the actuator mechanism as a function of the calculated first and second centers of gravity (sections 0019-0023).

Regarding claim 20, Thia et al. disclose: wherein the means for determining the mass unbalance of the actuator mechanism is configured to calculate the mass unbalance by implementing the steps comprising: multiplying the mass of the actuator mechanism with the square root of the sum of the second x component squared and the second y component squared (section 0023).

Allowable Subject Matter

7. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and to overcome the objection set forth above.

8. Claims 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

9. The following is an examiner's statement of reasons for allowance:

The primary reason for the allowance of claims 5 and 6 is the inclusion of the limitation that calculating the first x component in the first coordinate system comprises: obtaining a third VCM current when the system is oriented in a third orientation; and obtaining a fourth VCM current when the system is oriented in a fourth orientation. It is this limitation found in each of the claims, as it is claimed in the combination that has not

been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 15 is the inclusion of the limitations of obtaining a third VCM current when the actuator mechanism is oriented in a third orientation; obtaining a fourth VCM current when the actuator mechanism is oriented in a fourth orientation; and calculating the first x component in the first x-axis as a function of the third VCM current and the fourth VCM current. It is this limitation found in the claim, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.


The primary reason for the allowance of claims 16 and 17 is the inclusion of the limitations of calculating a first angle between the first y-axis and a line that extends from the pivot shaft to a central axis of a storage media; calculating a second angle between the second y-axis and the line that extends from the pivot shaft to the central axis of the storage media; calculating a third angle as a function of the first angle and the second angle; calculating the second y component as a function of the first x component, the first y component and the third angle; and calculating the second x component as a function of the first x component, the first y component and the third angle. It is these limitations found in each of the claims, as it is claimed in the combination that has not been found, taught or suggested by the prior art of record, which makes these claims allowable over the prior art.


Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

XS 
June 18, 2007


John Barlow
Supervisory Patent Examiner
Technology Center 2800